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FORM PTO-1390 (REV 12-29-99) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER: Beiersdorf 653-WCG

U.S. APPLICATION NO. (If known, see 37 CFR 1.5): 09/646553

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/EP99/01849	19 March 1999 (19.03.99)	(See "Appendix")

TITLE OF INVENTION: (See "Appendix")

APPLICANT(S) FOR DO/EO/US: (1) Michael GILLET; (2) Christoph LENZ; (3) Dr. Dirk LENZ; (4) Dr. Helmut LINDER; (5) Jurgen TIMM

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. [X] This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. [ ] This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. [X] This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. [X] A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. [X] A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. [ ] is transmitted herewith (required only if not transmitted by the International Bureau).
   b. [X] has been transmitted by the International Bureau.
   c. [ ] is not required, as the application was filed in the United States Receiving Office (RO/US).
6. [X] A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. [ ] Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. [ ] are transmitted herewith (required only if not transmitted by the International Bureau).
   b. [ ] have been transmitted by the International Bureau.
   c. [ ] have not been made; however, the time limit for making such amendments has NOT expired.
   d. [ ] have not been made and will not be made.
8. [ ] A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. [X] An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. [ ] A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included:

11. [X] An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. [X] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. [X] A FIRST preliminary amendment.
    [ ] A SECOND or SUBSEQUENT preliminary amendment.
14. [ ] A substitute specification.
15. [ ] A change of power of attorney and/or address letter.
16. [X] Other items or information:
    a) Copy of cover sheet from published application WO 99/48684;
    b) Priority documents DE 198 12 403.1 and DE 198 26 455.0;
    c) Copy of International Search Report;
    d) Copy of Preliminary Examination Report

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U.S. APPLICATION NO (If known, see 37 CFR 1.5)	INTERNATIONAL APPLICATION NO	ATTORNEY'S DOCKET NUMBER
09/646553	PCT/EP99/01849	Beiersdorf 653-WCG

17. [X] The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :	CALCULATIONS PTO USE ONLY
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO $970.00	
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO $840.00	
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO $690.00	
International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) $670.00	
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) $96.00	

ENTER APPROPRIATE BASIC FEE AMOUNT =				$ 840.00	
Surcharge of **$130.00** for furnishing the oath or declaration later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				$	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	14 - 20 =	--	X $18.00	$	
Independent claims	7 - 3 =	4	X $78.00	$ 312.00	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ $260.00	$	
TOTAL OF ABOVE CALCULATIONS =				$	
Reduction of 1/2 for filing by small entity, if applicable. A Small Entity Statement must also by filed (Note 37 CFR 1.9, 1.27, 1.28).				$	
SUBTOTAL =				$	
Processing fee of **$130.00** for furnishing the English translation later than [ ]20 [ ]30 months from the earliest claimed priority date (37 CFR 1.492(f)). +				$	
TOTAL NATIONAL FEE =				$	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property +				$	
TOTAL FEES ENCLOSED =				$ 1,152.00	
				Amount to be: refunded	$
				charged	$

a. [ ] A check in the amount of $_____ to cover the above fees is enclosed.

b. [X] Please charge my Deposit Account No. 14-1263 in the amount of $ 1,152.00 to cover the above fees. A duplicate copy of this sheet is enclosed.

c. [X] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 14-1263. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO.

Norris, McLaughlin & Marcus, P.A.
660 White Plains Road
Tarrytown, New York 10591

SIGNATURE:

William C. Gerstenzang
NAME

27,552
REGISTRATION NUMBER

BEIERSDORF 653-WCG
6713-St-ar

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants	:	Michael GILLET; Christoph LENZ; Dr. Dirk LENZ; Dr. Helmut LINDER; Jürgen TIMM
Serial No.	:	To Be Assigned
Filed	:	Herewith
For	:	LAMINATE, METHOD FOR PRODUCING SAME AND USE OF A LAMINATE ESPECIALLY AS A MEDICINAL SUPPORT MATERIAL
Art Unit	:	To Be Assigned
Examiner	:	To Be Assigned

September 19, 2000

BOX PCT
Hon. Assistant Commissioner For Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

In advance of prosecution, the Examiner is respectfully requested to amend the application as follows and consider the following remarks:

IN THE CLAIMS

Claim 1 (amended). Laminate composed of at least a first layer of an elastic polymer film and of a second layer of an elastic textile sheet, where the finished laminate has a microscopic **[**and/or**]** effect, a macroscopic embossed effect, or both.

Claim 2 (amended). Laminate according to Claim 1, **[**characterized in that**]** wherein the weight per unit area of the polymer film is from 15 to 150 g/m^2, **[**in particular from 35 to 60 g/m^2, and/or**]** the weight per unit area of the textile sheet is from 25 to 200 g/m^2, **[**in particular from 30 to 100 g/m^2**]** or both.

Claim 3 (amended). Laminate according to **[**Claims 1 and 2, characterized in that**]**

Claim 1, wherein the polymer film of the first layer has a structure [of] comprising more than one layer of a copolymer of ethylene and polar comonomers or of a mixture of LDPE and an LLDPE, prepared by a metallocene-catalysed process.

Claim 4 (amended). Laminate according to [Claims 1 to 3, characterized in that] Claim 1, wherein the polymer film of the first layer is a copolymer of ethylene and an α-olefin having a carbon number of from C_4 to C_{10}, where the polyolefin has a melt index of from 1 to 20 g/(10 min) and a density of from 860 to 900 kg/m^3.

Claim 5 (amended). Laminate according to [Claims 1 to 4, characterized in that] Claim 1, wherein the first layer is composed of two coextruded layers with an outer layer and a tie layer, where the tie layer is composed of pure thermoplastic polyolefins without addition of additives or colorants.

Claim 6 (amended). Laminate according to [Claims 1 to 5, characterized in that] Claim 1, wherein the polymer film of the first layer comprises at least 65% of a thermoplastic elastomer.

Claim 7 (amended). Laminate according to [Claims 1 to 6, characterized in that] Claim 1, wherein a self-adhesive coating has been applied onto the textile sheet side.

Claim 8 (amended). Process for producing a laminate according to Claim 1, wherein [at least one of the preceding claims, characterized in that]

a) polymer granules or mixtures of polymer granules are melted in one or more extruders,

b) the polymer melts of the extruders are brought together in a feed block, and a [multilayer structure] film having at least one layer of the polymer [film] is formed in the slot die,

c) the melt film formed is applied to a textile sheet,

d) the resultant laminate is compressed through a calender unit and cooled, and

e) the surface of the polymer film of the laminate is embossed[, preferably using a cylindrical steel roll].

Claim 9 (amended). Process according to Claim 8, [characterized in that,] wherein after extrusion, the polymer melt film is passed between a previously produced elastic polymer film and the textile sheet, and is then cooled.

Claim 10 (amended). [Use of a laminate according to at least one of the preceding claims as a] A medical backing material[, where] comprising a laminate according to Claim 1 with a skin-compatible self-adhesive coating has been applied to the nonwoven side.

Claim 11 (amended). [Use of a laminate according to at least one of the preceding claims as a] A medical backing material[, where the] comprising a laminate according to Claim 1, wherein the laminate is provided with the self-adhesive coating and is physically perforated.

Claim 12 (amended). [Use of a laminate according to at least one of the preceding claims as carrier for a hygiene item, in particular a nappy or an incontinence product.] A diaper comprising the laminate of Claim 1.

Claim 13 (amended). [Use of a laminate according to at least one of the preceding claims as a single-use covering material for uses associated with surgical procedures.] A surgical drape comprising the laminate of Claim 1.

Claim 14 (amended). [Use of a laminate according to at least one of the preceding

claims as a material employed in] An article of protective clothing comprising the lamiante of Claim 1.

REMARKS

This Preliminary Amendment is being filed to eliminate multiple dependency and to conform the claims to conventional format.

Favorable action is respectfully solicited.

ADDITIONAL FEE

Please charge any insufficiency of fees, or credit any excess, to Deposit Account No. 14-1263.

Respectfully submitted,

NORRIS, McLAUGHLIN & MARCUS, P.A.

By _____
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I hereby certify that this paper is being deposited with the United States Postal Service as Express Mail, Label No EI148422266US, addressed to: Hon. Asst. Commissioner of Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513.

Norris McLaughlin & Marcus, P.A.

By: _____

Date: 9/19/00

Beiersdorf Aktiengesellschaft
Hamburg

Description

Laminate, process for its production, and the use of a laminate in particular as a medical backing material

The invention relates to a laminate, a process for its production, and its use in the hygiene and medical sectors, in particular as a backing material for first-aid wound pads and roll plasters and other applications in which the elasticity of the laminate and an excellent bond are advantageous.

Laminates used as medical backings have already been described.

For example, EP 0 446 431 has disclosed a backing material for medical plasters which is formed from a laminate which in turn is composed of a first polymer film layer, a second film layer produced on the first polymer film layer, and a third layer of a macroporous textile material, to some extent embedded within the second layer and thus anchored therein. The first-mentioned layers are preferably composed of polyurethane, and the textile material is in particular formed by a polyester nonwoven or by a lattice tulle.
The backing material may then have a self-adhesive, skin-compatible coating, preferably on the textile side of the material.

WO 97/42922 has disclosed a production process for a laminate which on one side has a self-adhesive coating. For this, a polymer film is melted on a thermoplastic woven or nonwoven by the action of heat, where the heat does not act over the entire surface. A self-adhesive coating is moreover applied to the

woven side or nonwoven side, and a wound pad may in turn be placed onto this coating.

A frequent disadvantage of the known coatings is that the laminates delaminate under mechanical stress, and this is particularly the case for medical products. It is also possible that the laminates are not of a single material and therefore production residues which arise, or sheets of used products cannot be recycled.

An object of the invention is therefore to provide a laminate which avoids the disadvantages known from the prior art. It should be cost-effective to produce and not present ecological hazards, and should also be pleasant to use.

This object has been achieved by means of a laminate as described in Claim 1. The subject matter of the subclaims here is advantageous embodiments of the laminate, a process for its production, and its use, in particular as a medical product.

The invention proposes a laminate composed of at least a first layer of an elastic polymer film and of a second layer of an elastic textile sheet, where the finished laminate has a microscopic and/or macroscopic embossed effect.
The textile sheet is preferably a nonwoven material or a woven.

The materials used as the elastic polymer film are in particular homopolymers of polyethylene, copolymers of ethylene and an α-olefin with a carbon number of from C_4 to C_{10}, such as LDPE, LLDPE, VLLDPE or ULLDPE or polyethylene, prepared in a metallocene-catalysed process or in a „single-site-type"-catalysed process, copolymers of EVA, ethylene-alkyl acrylate, ethylene-methyl acrylate, ethylene-acrylic acid and ionomers, and also homopolymers and copolymers of polypropylene, for example isotactic, atactic and/or syndiotactic PP, copolymers of PP and PE, copolymers of PP and butene, and others, all preferably prepared via Ziegler-Natta catalysis or metallocene-catalysis, and finally also mixtures of the polymers mentioned.

In a preferred embodiment the first layer of the laminate has a structure of more than one layer of a copolymer of ethylene and polar comonomers or of a mixture of LDPE and an LLDPE, prepared by a metallocene-catalysed process (m-PE).

In another preferred embodiment the polymer film of the first layer is a copolymer of ethylene and an α-olefin having a carbon number of from C_4 to C_{10}, where the polyolefin has a melt index of from 1 to 20 g/(10 min) and a density of from 860 to 900 kg/m^3.

In another preferred embodiment the first layer of the laminate is composed of two coextruded layers with an outer layer and a tie layer, where the tie layer is composed of pure thermoplastic polyolefins without addition of additives or colorants.

The polymer film of the first layer may also comprise at least 65% of a thermoplastic elastomer.

The materials used for the fibres of the textile sheet are likewise the abovementioned polymers, specifically also as a mixture or as coextrudates, and also viscose and derivatives thereof, polyesters or modified polyesters and polyamides.

A nonwoven used for this purpose may be produced by spinbonding, meltblowing, thermobonding, wet laying, carding or weaving, or also combinations of the processes listed.

Examples of other additives which are added to the polymer mixtures are heat stabilizers, UV stabilizers, antistats, antislip additives and antimicrobial or fungicidal substances.

This invention includes variations in the formulation of the polymer mixtures or in the production process which are obvious to a person skilled in the art.

The weight per unit area of the polymer film of the first layer is preferably from 15 to 150 g/m^2, in particular from 35 to 60 g/m^2, and/or the weight per unit area of the textile sheet is from 25 to 200 g/m^2, in particular from 30 to 100 g/m^2.

It is preferable for a skin-compatible self-adhesive coating to have been applied to the textile sheet side.

The following steps are used in particular in order to produce this laminate. These steps may be carried out continuously or separately, without affecting the properties of the product.

Mixtures of polymers with a melt index of from 1 to 20 g/(10 min) are introduced, in the form of pellets or granules, to one or more extruders, are mixed or melted there, and then form a continuous stream. (The temperature of the melt is from 175 to 330°C).

In the case of coextrusion, the stream of the polymer melt is brought together in an adapter (feed block) and a coextruded melt film is formed in a slot dye. The melt film emerges from the slot dye and is cooled between two cylinders, where one of the cylinders may have been engraved, in order to give the film an embossed effect (calender unit). The nonwoven or the textile sheet is conducted between the two cylinders in such a way that the melt film is laid on the embossed cylinder. The temperature of the cooling rolls here is from 10 to 65°C.

The engraving of the cooling rolls or the engraving of the surface of the cooling rolls gives the laminate particular surface properties: a microscopic emboss (from 10 to 200 µm) makes the surface soft and matt, and a macroscopic emboss (from 200 to 3000 µm) gives the film similarity to a textile. In the case of coextrusion with two or more layers, the feed block process, multimanifold process or tandem extrusion coating process is used.

This "cast" process may be carried out in a similar manner using a previously produced film made from the polymers described above, where one side of the film may have been embossed, and a textile sheet, where the two layers are introduced to the extrusion plant and joined together (heat-lamination) by means of a molten film made from the polymers described above.

In another preferred version of the process at least two sets of polyolefin granules are each melted in an extruder and applied simultaneously in at least two layers onto the textile sheet.

If desired, one side of the laminate, specifically the nonwoven side, may be provided with a self-adhesive coating, to which a wound pad may be applied if desired.

For physical perforation of the backing material coated with pressure-sensitive adhesive, a microperforation system, preferably in the form of a spiked roller, is used at elevated temperatures of from 100 to 130°C. This gives the coated backing material permeability to air.

The laminate used according to the invention is a film-nonwoven composite with extremely high elasticity in longitudinal and transverse directions, good cushioning properties (through the use of the nonwoven) and a very agreeable soft film surface through use of a specific emboss effect.

Nonwoven and film here preferably have similar recovery capabilities, so that no delamination of the composite material occurs at elongations up to well over 100%.

Besides the cushioning properties of the composite material, for use as a plaster emphasis should be given to the absorption of moisture (water vapour) by the nonwoven material on the side facing the skin (wear comfort).

To achieve these properties, the production of the laminate uses, inter alia, specific metallocene LLDPE grades which, in the form of sheetlike materials and in combination with the particular surface-embossed effect, give the particular feel (soft and comforting) and elasticity.

Other advantages of the use of the metallocene PE materials:

a) low migration, i.e. no migration of low-molecular-weight constituents to the surface, and therefore good anchoring of pressure-sensitive adhesive compositions, and non fall-off of surface tension even after prolonged storage;
b) no addition of stearates necessary (BSE);
c) high purity of the polymer used (smallest traces of the catalyst used); and
d) density and polydispersity of the polymer used can be adjusted within the ranges desired.

The particular feel is a function of the large number of abovementioned components and processes, and also of the choice of the nonwoven material, of the PE grades in the film (LLDPE; VLDPE), of the surface-embossed effect of the film and of the textile sheet, and also of the manner in which the production process for the laminate is conducted.

In particular the use of a 50 µm metallocene PE (VLDPE) film gives better contact between the nonwoven fibres and the PE film (via viscosity properties of the

polymer melt) than with conventional PE grades. Consequently the film-nonwoven composite does not delaminate, even on extreme elongation.

In most laminates produced for hygiene applications (nappies) the nonwoven side is used as outer side, mostly because it gives a higher-quality impression, but there is no direct benefit for the product. When the novel laminate is used as a medical backing material the nonwoven side in the product (preferably a plaster) is used as inner side. This gains the additional function of a moisture retainer if the application of the pressure-sensitive adhesive is, as is preferred, in the form of spots or a grid.

This property improves the adhesion of the plaster on the skin, since film plasters usually have extremely limited adhesion when worn for a relatively long period at relatively high temperatures and atmospheric humidity (moisture accumulates under the (impermeable) film plaster and causes rapid release of the entire product).

The laminate may moreover be used for the production of self-adhesive bandages or of similar products.

The particular properties of the laminate also indicate a possible use as backing for a hygiene item, in particular a nappy or an incontinence product.

The material is advantageously suitable for single-use covering materials for uses associated with surgical procedures, and as a material employed in protective clothing.

The laminate makes it possible to save costs, since low-cost raw materials are used for the essentially single-step production process.

Compared with other thermoplastic elastomers, metallocene polyolefins are relatively inexpensive polymers.

The melt extrusion process is a very cost-effective process, since it is merely a modification of a casting process for producing a polyolefin film. The melt film is simply laid on a textile sheet instead of on a cooling roll.

There is no need for any additional step, unlike, for example, in off-line lamination of a previously extruded and cooled film to a textile sheet using hot-melt adhesives.

Ecological considerations are also taken into account in the use of the novel laminate. The preferred embodiment of the product is produced from a single raw material, specifically pure olefins. This laminate can be recycled since a single-material product, and also any production residues which may arise and sheets of used products, can be reutilized.

The particularly advantageous properties of the laminate will be described again using the figures below, and the production of an extrusion-laminated composite product will be illustrated by a number of examples, without any intention of unnecessarily limiting the invention described to particular product formulations or process steps.

Figure 1 shows the layer structure of the laminate.

Figure 2 shows the extrusion-lamination plant.

Figure 3 shows diagrammatically the structured surface of the laminate as a result of microscopic or macroscopic embossing.

Figure 4 shows a micrograph of the upper side of the laminate.

Figure 5 shows a micrograph of the lower side of the laminate.

Examples

Example 1

In Figure 1 the laminate is composed of three layers, an outer layer (16), a tie layer (15) and a textile sheet, i.e. a nonwoven (1).

The outer layer (16) of the laminate is composed of a mixture of a thermoplastic polyolefin (MI (melt index) = 3.5 dg/min; density δ = 0.875 g/cm^3 (ASTM D-1505)) and of an LDPE (MI = 2.5 dg/min; density δ = 0.916 g/cm^3 (ASTM D-1505)) in a ratio of 90 to 10. The polymer mixture is melted in the extruder together with 5% by weight of a ready made PE colour batch.

The tie layer (15) of the laminate is composed of a thermoplastic polyolefin (MI = 3.5 dg/min; density δ = 0.875 g/cm^3 (ASTM D-1505)) and is melted in a second extruder.

The textile sheet (1) is composed of a spun nonwoven made from VLDPE or from a mixture of VLDPE and VLLDPE. It has a macroscopic diamond-shaped embossed effect, as illustrated in Figure 5 (lower side of the laminate). Other properties of the nonwoven material are described in Table 1.

TABLE 1: PHYSICAL PROPERTIES OF THE NONWOVEN MATERIAL

Property	**Method**	**Value measured**
Weight per unit area	EN 29073 T1	50 g/m^2
Ultimate tensile strength longitudinal transverse	EN 29073 T1	 44 N/5 cm 23 N/5 cm
Elongation longitudinal transverse	EN 29073 T1	 194% 190%
Titre	DIN 53 811	3.5 dtex

The structured surfaces obtained by giving the laminate a microscopic or macroscopic embossed effect, shown in Figure 3, are classified as:

- Stinflex and Velvaflex (51)
- Taffaflex (52)
- Mayaflex (53)

Figure 2 shows the extrusion-lamination plant.

The two polymer melts for the outer layer and tie layer are brought together in the feed block of the extruder (41) and shaped in the slot dye (42). The ratio of outer layer (16) to tie layer (15) here is about 70 to 30, and the weight per unit area of the polymer film is about 50 g/m^2. The temperature of the slot dye is from 240 to 260°C.

The laying of the two-layer molten film on the nonwoven (1), which is conveyed via an unwind unit (2), is carried out in such a way that the tie layer (15) comes into contact with the nonwoven (1) and the outer layer (16) comes into contact with the cooled engraved roll (34) in the calender unit (31). The contact with the engraved roll (34) provides the outer layer (16) with a microscopic diamond-shaped embossed effect, illustrated in Figure 4 (upper side of the laminate). The macroscopic embossed effect, which is four times larger, of the nonwoven (1) is also reproduced in the finished laminate (11), and it is therefore possible to detect and to feel, on the upper side of the film, a transferred microscopic/macroscopic embossed effect of the same Velvaflex pattern. As a result of this the laminate (11) gives a higher-quality impression.

The laminate (11) is finally wound up.

The thickness of the laminate (11) is markedly smaller at the emboss points of the nonwoven (1) (partly melted fibres). The impression given is that the entire laminate (11) has both a microscopic and a macroscopic embossed effect. This results in a softer textile handle of the laminate (11), both on the film side and for the nonwoven side.

As this structure gives very good enclosure of the fibres of the nonwoven (1), the result is a perfect composite of the two components, film and nonwoven. Even when elongation is extreme, no delamination of the composite material occurs.

The composite material described is characterized by further parameters (see Table 2).

The present laminate (11) was coated with pressure-sensitive adhesives of acrylate type or natural-rubber type. Plaster strips (19 mm x 72 mm) were stamped out under standard fabricating conditions with application of a wound pad.

Example 2

The outer layer (16) of the laminate is composed of a thermoplastic polyolefin (MI (melt index) = 3.5 dg/min; density δ = 0.875 g/cm^3 (ASTM D-1505)), which is

melted in the extruder together with a ready made PE colour batch (5% by weight).

The tie layer (15) of the laminate is composed of a thermoplastic polyolefin (MI = 3.5 dg/min; density δ = 0.875 g/cm^3 (ASTM D-1505)), which is melted in a second extruder.

The nonwoven material used is the same as that in Example 1.

The ratio of outer layer to tie layer here is about 60 to 40, and the weight per unit area of the polymer film is about 50 g/m^2.

The extrusion conditions chosen are as for Example 1.
The composite material described is characterized by further parameters (see Table 2).

Example 3

The outer layer (16) of the laminate is composed of a mixture of a thermoplastic polyolefin (MI (melt index) = 3.5 dg/min; density δ = 0.875 g/cm^3 (ASTM D-1505)) and an LDPE (MI = 2.5 dg/min; density δ = 0.916 g/cm^3 (ASTM D-1505)) in a ratio of 80 to 20. The polymer mixture is melted in the extruder together with 5% by weight of a ready made PE colour batch.

The tie layer (15) of the laminate is composed of a thermoplastic polyolefin (MI = 3.5 dg/min; density δ = 0.875 g/cm^3 (ASTM D-1505)), which is melted in a second extruder.

The nonwoven material used is the same as that in Example 1.
The ratio of outer layer to tie layer here is about 60 to 40, and the weight per unit area of the polymer film is about 50 g/m^2.
The extrusion conditions chosen are as for Example 1.

The composite material described is characterized by further parameters (see Table 2).

Example 4

Only one layer of a PE polymer is used for the lamination.

The polymer layer (16) of the laminate is composed of a thermoplastic polyolefin (MI (melt index) = 3.5 dg/min; density δ = 0.875 g/cm^3 (ASTM D-1505)). The polymer is melted in the extruder together with 4% by weight of a ready made PE colour batch.

The nonwoven material used is the same as that in Example 1.

The weight per unit area of the polymer film is about 50 g/m^2.

The extrusion conditions chosen are as for Example 1.

The composite material described is characterized by further parameters (see Table 2).

Example 5: comparative product, non-elastic laminate

The lamination of the nonwoven material of Example 1 here was carried out using conventional LDPE grades.

The outer layer (16) of the laminate is composed of an LDPE polymer (MI (melt index) = 12 dg/min; density δ = 0.916 g/cm^3 (ASTM D-1505)). The polymer is melted in the extruder together with 5% by weight of a ready made PE colour batch.

The tie layer (15) of the laminate is composed of an LDPE polymer (MI = 12 dg/min; density δ = 0.916 g/cm^3 (ASTM D-1505)), which is melted in a second extruder.

The nonwoven material used is the same as that in Example 1.

The ratio of outer layer to tie layer here is about 60 to 40, and the weight per unit area of the polymer film is about 60 g/m^2.

The extrusion conditions are as follows: The temperatures for the extruder and the slot dye are set at 280°C.

The composite material described is characterized by further parameters (see Table 2).

TABLE 2: COMPARATIVE OVERVIEW OF PHYSICAL DATA OF THE LAMINATES PRODUCED IN EXAMPLES 1 TO 5

Parameter / Method	**Unit**	**Example 1**	**Example 2**	**Example 3**	**Example 4**	**Example 5 (Reference)**
Weight per unit area / DIN 53352	g/m^2	108.1	105.7	107.3	104.4	112.5
Tensile force - longitudinal	N/inch					
Force for 10% elongation		11.9	11.4	11.6	9.9	18.3
for 50% elongation		20.2	19.9	19.7	16.8	26.2
for 100% elongation		24.5	24.3	23.8	20.5	29.7
Tensile force - transverse	N/inch					
Force for 10% elongation		6.5	6.7	6.7	6.1	14.3
for 50% elongation		12.2	12.6	13.1	11.5	20.5
for 100% elongation / ASTM D-882		15.1	15.5	16.4	14.4	23.0
Permanent deformation longitudinal *)	%					
for 50% elongation		0	0	0	0	0
for 100% elongation		10	10	16	10	26
for 150% elongation		40	32	36	36	60
Permanent deformation transverse *)	%					
for 50% elongation		0	0	0	0	0
for 100% elongation		10	10	10	10	27
for 150% elongation		32	26	30	26	70
Delamination		none	none	none	none	slight

*) Permanent deformation: Permanent deformation of the specimen in % occurring after elongation by x % of its initial length. The elongation is maintained for 30 seconds and the specimen is then released.

Comparison of Examples 1 to 5

The laminates from Examples 1 to 4 show low levels of plastic deformation after, respectively, 50 and 100% elongation, either in a longitudinal or in a transverse direction, and this proves to be advantageous in the use of these laminates. The comparative material (conventional PE laminate, Example 5) shows, in contrast, markedly higher plastic deformation.

Comparatively small forces are required to achieve small elongations (respectively 10 and 50%) in the laminates of Examples 1 to 4. This is a decisive factor for comfort in the final product. In the comparative material made from conventional LDPE (Example 5), in contrast, markedly higher forces are required to achieve the same elongation.

The composite of the laminate materials of Examples 1 to 4 cannot be separated, even when elongation is very high. The material of Example 5, in contrast, exhibits slight delamination at very high elongation.

Patent claims

1. Laminate composed of at least a first layer of an elastic polymer film and of a second layer of an elastic textile sheet, where the finished laminate has a microscopic and/or macroscopic embossed effect.

2. Laminate according to Claim 1, characterized in that the weight per unit area of the polymer film is from 15 to 150 g/m^2, in particular from 35 to 60 g/m^2, and/or the weight per unit area of the textile sheet is from 25 to 200 g/m^2, in particular from 30 to 100 g/m^2.

3. Laminate according to Claims 1 and 2, characterized in that the polymer film of the first layer has a structure of more than one layer of a copolymer of ethylene and polar comonomers or of a mixture of LDPE and an LLDPE, prepared by a metallocene-catalysed process.

4. Laminate according to Claims 1 to 3, characterized in that the polymer film of the first layer is a copolymer of ethylene and an α-olefin having a carbon number of from C_4 to C_{10}, where the polyolefin has a melt index of from 1 to 20 g/(10 min) and a density of from 860 to 900 kg/m^3.

5. Laminate according to Claims 1 to 4, characterized in that the first layer is composed of two coextruded layers with an outer layer and a tie layer, where the tie layer is composed of pure thermoplastic polyolefins without addition of additives or colorants.

6. Laminate according to Claims 1 to 5, characterized in that the polymer film of the first layer comprises at least 65% of a thermoplastic elastomer.

7. Laminate according to Claims 1 to 6, characterized in that a self-adhesive coating has been applied onto the textile sheet side.

8. Process for producing a laminate according to at least one of the preceding claims, characterized in that

   a) polymer granules or mixtures of polymer granules are melted in one or more extruders,

b) the polymer melts of the extruders are brought together in a feed block, and a multilayer structure of the polymer film is formed in the slot die,

c) the melt film formed is applied to a textile sheet,

d) the resultant laminate is compressed through a calender unit and cooled, and

e) the surface of the polymer film of the laminate is embossed, preferably using a cylindrical steel roll.

9. Process according to Claim 8, characterized in that, after extrusion, the polymer melt film is passed between a previously produced elastic polymer film and the textile sheet, and is then cooled.

10. Use of a laminate according to at least one of the preceding claims as a medical backing material, where a skin-compatible self-adhesive coating has been applied to the nonwoven side.

11. Use of a laminate according to at least one of the preceding claims as a medical backing material, where the laminate provided with the self-adhesive coating is physically perforated.

12. Use of a laminate according to at least one of the preceding claims as carrier for a hygiene item, in particular a nappy or an incontinence product.

13. Use of a laminate according to at least one of the preceding claims as a single-use covering material for uses associated with surgical procedures.

14. Use of a laminate according to at least one of the preceding claims as a material employed in protective clothing.

Abstract

Laminate, composed of at least one first layer of a elastic polymer film and of one second layer of a elastic textile sheet, where the finished laminate has a microscopic and/or macroscopic embossed effect.

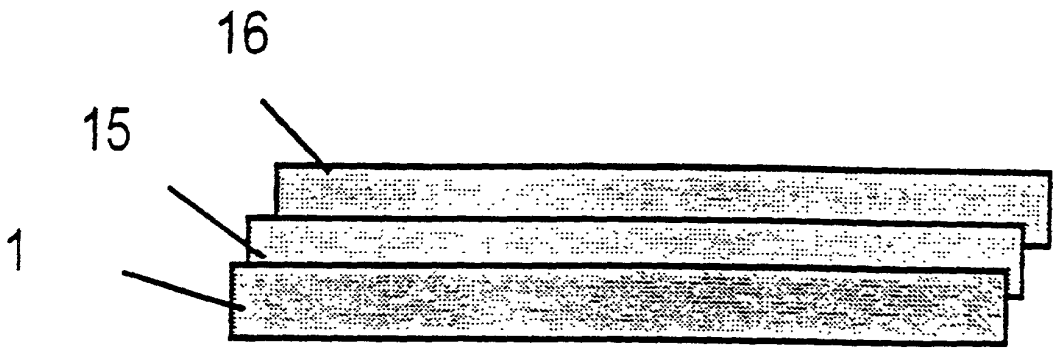

Figure 1

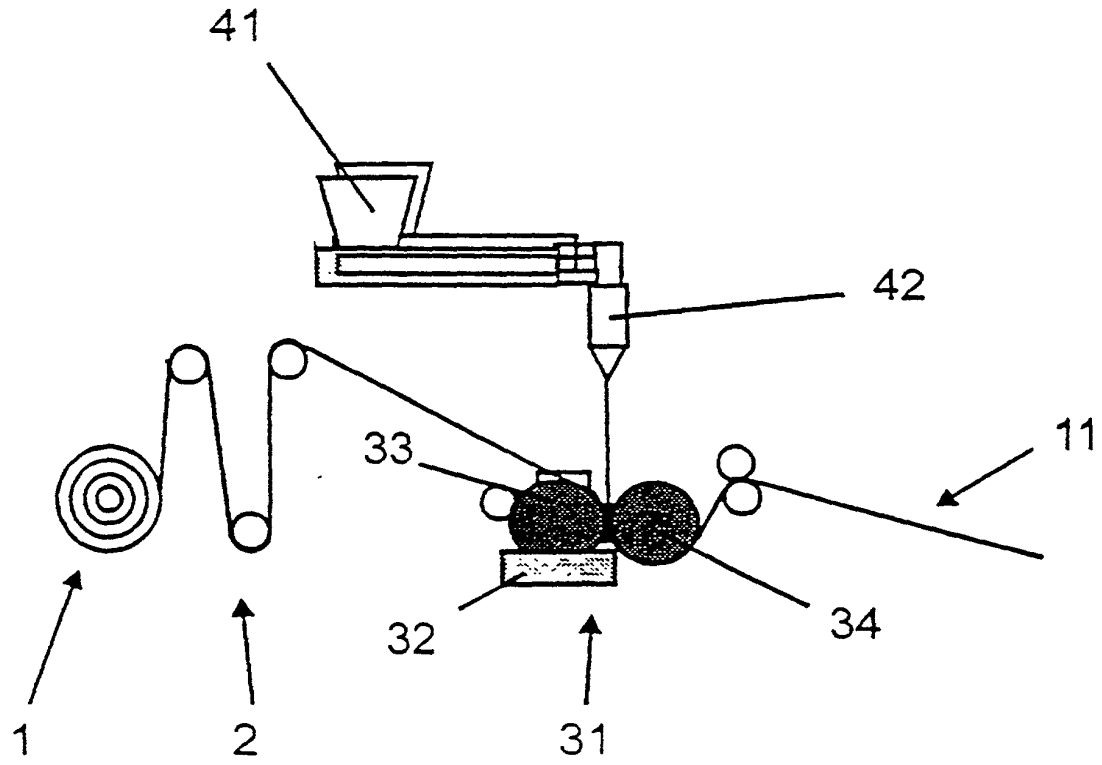

Figure 2

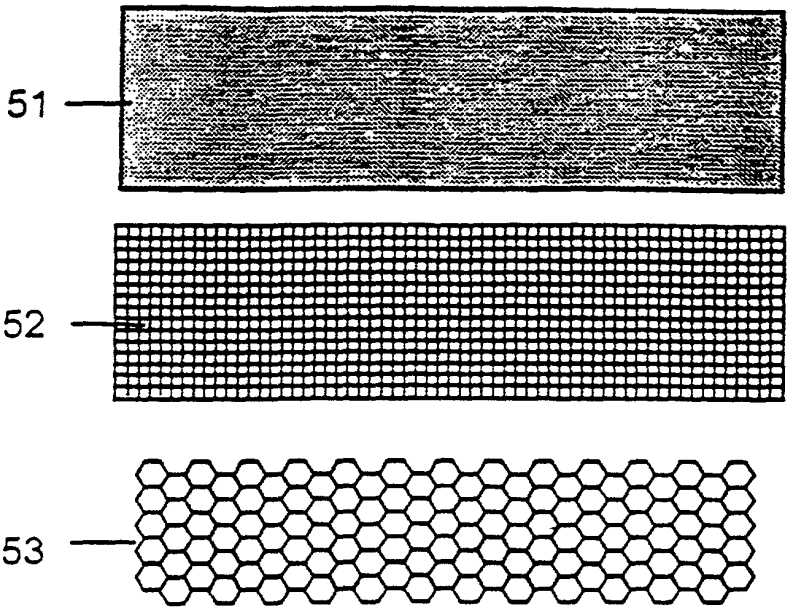

Figure 3

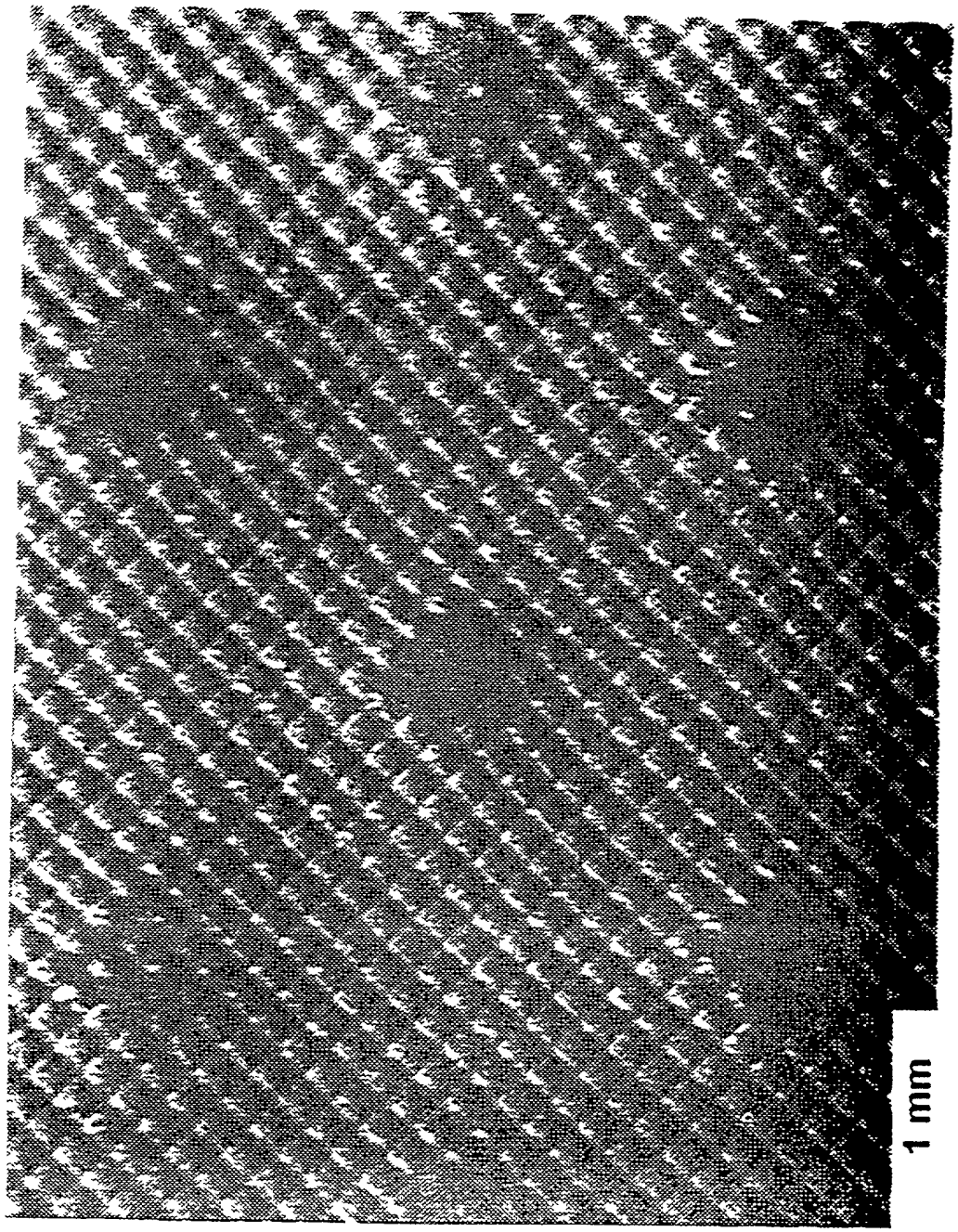

Fig. 4

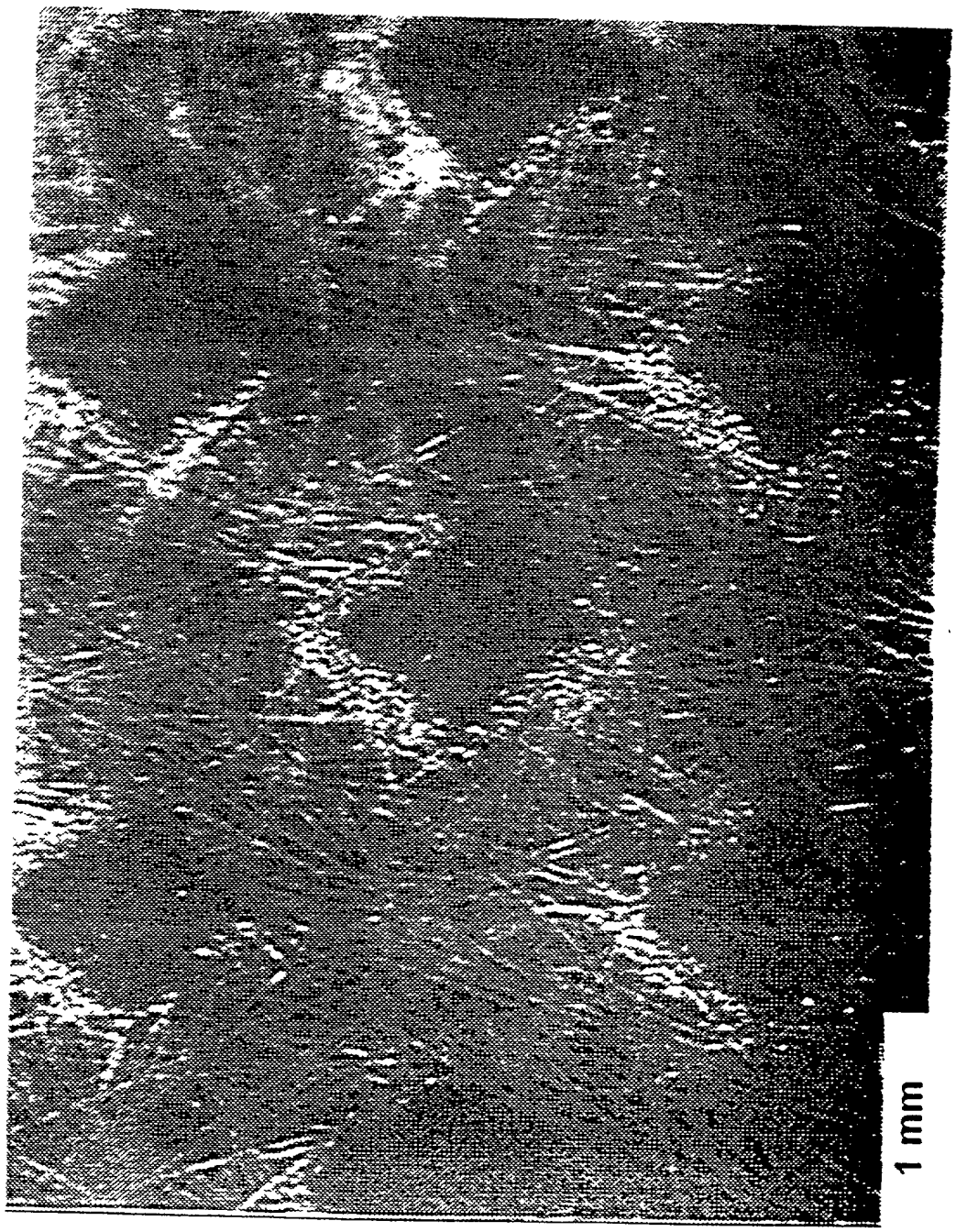

Fig. 5

COMBINATION DECLARATION & POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled **„Laminate, method for producing same and use of a laminate especially as a medicinal support material“**
the specification of which is attached hereto.

-OR-

was filed on _____ as

Application Serial No. _____ and was amended _____

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority Claimed
198 12 403.1 (Number)	Germany (Country)	20/03/1998 (Day/Month/Yr. Filed)	[X] yes [ ] no
198 26 455.0 (Number)	Germany (Country)	13/06/1998 (Day/Month/Yr. Filed)	[X] yes [ ] no

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

PCT/EP99/01849 (Application Serial No.)	19/03/1999 (Filing Date)	pending (Status) (patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punished by fine or imprisonment, or both under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named Inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:

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APPENDIX

Beiersdorf 653-WCG
6713-St-ar

TITLE:

LAMINATE, METHOD FOR PRODUCING SAME AND USE OF A LAMINATE ESPECIALLY AS A MEDICINAL SUPPORT MATERIAL

LIST OF INVENTORS:

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13 June 1998 (13.06.98)

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Date of Deposit: **September 19, 2000**

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

NORRIS, McLAUGHLIN & MARCUS, P.A.

By: _____

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